The U. S. Regional Pasture Research Laboratory
State College, Pennsylvania
June 1, 1954

The U. S. Regional Pasture Research Laboratory was established in 1936 with Bankhead-Jones Funds by officials of the U. S. Department of Agriculture at the suggestion of the Directors of the 12 State Agricultural Experiment Stations in the Region. Its purposes were (1) to serve as a focal point for the encouragement of cooperative effort in solving Regional pasture problems and (2) to conduct pasture research of broad Regional interest.

One of the initial steps taken was to set up a board of Collaborators. Each experiment station director designated a member of his staff who was appointed a collaborator with the Laboratory. This group representing a cross section of interest in pasture research of the Region has changed in membership, but diversification of subject matter interest has been maintained. The original board was made up of specialists in crops, soils, plant breeding, physiology, pathology, dairy production, and animal nutrition. One or more of the Collaborators have in addition been concerned directly with the administration of a state experiment station in the Region either as director or assistant director. Thus a framework has been maintained at all levels of administration for cooperation on pasture research in the Region.

The Collaborators and other state experiment station representatives together with officials of the United States Department of Agriculture including members of the Laboratory staff have held 11 regional meetings and have directly sponsored eight other meetings. Three of the sponsored meetings were concerned with plant breeding, three with plant climate, one with soil aspects of pasture management and one with the critical forage crop seed situation that developed during World War II. The early meetings of the collaborators were necessarily concerned with reviewing current pasture research projects at the State Stations and planning new ones both at the Laboratory and elsewhere in the Region so as to bring about a co-ordinated attack on basic problems. The review of projects and initiation of desirable shifts in emphasis have been continuing functions of this group. In addition special subjects have been emphasized, for example, measurement of results of pasture experimentation, and physiological approaches to pasture problems, were stressed at two of the meetings.

The United States Department of Agriculture, Agriculture Research Service, and the twelve Northeastern State Agricultural Experiment Stations Cooperating.

In the planning stage of new projects the Collaborators and others involved have made effective use of regional committees, one concerned with breeding, one with soil aspects of pasture management, one with plant climate and physiology, and one with utilization of forage crops particularly from the standpoint of dairy animals. In 1948 the Directors of the State Experiment Stations in the Region set up a Forage Crops Technical Committee to implement testing of plant materials on a regional basis. Tests supported in part by Research and Marketing funds (9b3) were carried on at seven locations in the Region under the guidance of this committee and with the cooperation of the Pasture Laboratory.

In addition to organized meetings, individuals or small groups from state stations in the Region have been encouraged to visit the Laboratory and Laboratory staff members have visited state stations to foster the cooperation desired.

Seventeen annual reports of progress on projects at the Laboratory, projects between State Stations and the Laboratory and projects carried on by the State Stations have been mimeographed and distributed to forage crop research workers in the Region and to a few other states and foreign countries. In addition rather detailed mimeographed reports of meetings and conferences already memtioned were prepared and distributed to interested persons within the Region.

In a sense all pasture research now carried on in the Region is cooperative and may be expected to result in the near future in new and better adapted varieties, in a better understanding of grassland management and in more effective utilization of the crops grown on grasslands. Almost all projects initiated during the last 18 years have been subjected to some regional analysis at the planning stage of development. Perhaps the most significant contribution of the Laboratory to the Northeastern Region is the part it has played in helping to bring about effective team work in the attack on pasture problems.

Research at the Laboratory was organized under five headings, cytogenetics and breeding, plant pathology, plant chemistry, soils, and pasture management including the physiology of growth responses and plant climate. At first emphasis was placed almost exclusively on basic research. Later and for various reasons, but particularly because of World War II, considerable emphasis was placed on applied research such as pasture renovation. After the War ended research at the Laboratory was reoriented along lines of more basic interest. Previous to the establishment of the Laboratory little attention had been given in this Region to the improvement of pastures by breeding superior strains. Now breeding forage crops is a major activity at several state stations, and the Laboratory is devoting relatively more of its time to the discovery of facts and plant materials useful in such breeding programs.

The scope and nature of the research that has been carried on are indicated by the titles of publications originating at the Laboratory that are listed below. Immediately following are brief descriptions of current research.

Varietal improvement of alfalfa, Ladino clover, and orchardgrass is being conducted in cooperation with the 12 Northeastern States. The emphasis in this program is placed on disease resistance and persistency in the legumes, and on date of maturity and midsummer production in orchardgrass. Nineteen of the 21 clones that make up Pilgrim Ladino clover were selected at the Laboratory from material originating in the Northeastern Region. Orchardgrass inbred lines are being used to study the possible role of inbreeding in forage crop improvement. The cytogenetic studies include intergeneric hybrids between perennial ryegrass and meadow fescue, interspecific relationships in Dactylis, Bromus and Phalaris, inheritance of maturity and male-sterility in orchardgrass and leaf color in Ladino clover.

In addition to the study of cultural and epiphytotic characteristics of the more important pathogenic organisms of forage crops, an effort is being made to determine experimentally the effect of disease on yield and quality. Many strains of red clover are being screened for resistance to Sclerotinia crown rot and Fusarium root rot with the hope of finding promising material for breeding purposes. Studies are under way to develop resistance in alfalfa to Pseudopeziza medicaginis and Ascochyta imperfecta, and to Sclerotinia trifoliorum in Ladino clover.

In the work on pasture management, the effects of climatic factors on plant growth are receiving primary attention with emphasis on plant responses to such environmental factors as temperature, relative humidity, wind velocity, and light as they occur in the field and under controlled conditions. Plant responses are evaluated in terms of vegetative growth, flowering, persistence, and disease injury. Techniques are being developed for measuring plant climate without seriously disturbing vegetation. Relationships between the climate as determined by the U. S. Weather Bureau and plant climate are being studied.

Soil investigations are concerned primarily with moisture, fertility and pasture management in relation to pasture production. Loss of water as runoff is being investigated in cooperation with the Pennsylvania Station. The response of forage crop species to soil moisture and frequency of irrigation is being investigated under various soil conditions. Particular attention is being given to factors affecting persistence of perennial legumes in grassland.

The current work in the field of plant chemistry is concerned with the identification and measurement of carbohydrates important as reserve substances in grasses; the relation of reserve substances to recovery of grasses following defoliation; the effect of stage

of growth and season on the nutritive value of different grass species; and the improvement of methods of analysis for the carbohydrate constituents in grasses and legumes.

In 1950 the Board of Trustees of The Pennsylvania State University adopted a plan whereby the part time employees of the Laboratory who pursue graduate studies are classed as graduate assistants in the University and as such are granted waiver of fees. Research carried on at the Laboratory may be offered as thesis material. This arrangement enables the Laboratory to attract able graduate students as part time assistants.

PUBLICATIONS ORIGINATING AT THE PASTURE LABORATORY

Cytogenetics and Breeding

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